

RESEARCH ARTICLE

Najaf City Between Urbanization and Changing Quality of Life an Analytical Study of The City's Reality In 2024

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Abstract

It has experienced an extreme metamorphosis in the last several decades, characterized by the fast demographic growth, diffusion of space, and accompanying changes in land-use patterns and the provision of social services in Najaf. The ongoing investigation attempts to identify the expressions of urbanization in Najaf through the methodical studying of demographic trends, spatial expansion patterns, and transformation of vital infrastructural sectors such as water supply, electrification, sanitation, and transport simultaneously evaluating the adequacy of the educational and health facilities. In this regard, our analysis uses decennial population censuses between 1977, 1987, 1997, 2009 and 2024, as well as spatial interrogation using satellite imagery and open-source GIS platforms. Najaf population data demonstrates that the population of the area has increased by some 6.3 per cent per year since the year 1977 with the population standing at 188,509 in the year 1977 and currently estimated to be 819,566. The urbanized area increased to 12,810 hectares as compared to the 900 hectares, which is a sign of massive sprawl. However, mounting inadequacies in water, electrical, transportation and sanitation services are also raised up in the study, which is made worse by the influx of informal housing, rising land prices, and environmental degradation. The quality of life indicators has been worsened in a number of districts due to the deficit of services and low quality infrastructure. Finally, the study emphasizes the need of comprehensive urban policies to improve standards of living, maximize the provision of spatial services to achieve sustainable urban development.

KEY WORDS

Najaf, Urbanization, Quality of Life, Infrastructure, Population Growth, Urban Services.

INTRODUCTION

Urbanization is one of the best conspicuous spatial and sociopolitical phenomena that have been accompanying the development of Iraqi urban centres in the recent decades. Urban restructuring and the change of lifestyle have been a combination of economic downturns and demographic changes. Najaf city is an example of such changes: it has experienced significant urbanization, and the population has significantly increased, which has impacted the delivery of

services and the standard of life in general. The quality of life in the urban environment is a multifactorial index that is predisposed by a broad complex of variables the effectiveness of infrastructure, the quality and availability of health and educational services, the urban environment per se, transport systems, housing, and spatial planning models. As a result, the empirical analysis of the nexus between urbanisation and the quality of life in Najaf provides a scientifically sound and

methodological way of understanding urban change and the subsequent implications of the phenomenon on the welfare of the population. The query aims at disaggregating the truth of urbanisation in Najaf in the following dimensions; evaluation of the demographic change and growth rates in the cities at 1977, 1987, 1997, 2009 and 2024; the identification of urban expansion trends and the pace of change in the urban foot print; evaluation of development of basic infrastructure (water, electricity, sanitation and road network); assessment of sufficiency and spatial distribution of educational and health services; discussion of housing and environmental challenges associated with rapid urbanisation; and lastly identification of The importance of the study lies in the fact that it makes use of a spatial analytical paradigm, which combines both quantitative and qualitative measures in an attempt to explain the lived reality of the city and develop a viable planning vision that will lead to an improved quality of life in the face of unprecedented urbanisation.

Research Problem: The city of Najaf is now facing a growing urban pressure, which is a result of an increased population growth and uncontrolled spatial development. Such pressures trigger the creation of disequilibria in the distribution of basic services and create a notable worsening of quality-of-life indicators. The following research question summarizes the research problem:

What is the extent of impact of accelerated urbanisation in the city of Najaf? What are the effects of urbanisation on the welfare of the residents of Najaf? And what are the main obstacles to the sustainable urban development in the metropolis?

Research Objectives

1. To examine population growth in Najaf and the development patterns that have been experienced since 1977 to 2024.
2. To define the trends of urbanisation, spatial development and the change in land use.
3. To assess the effectiveness of core infrastructure and key services (supply of water, electricity, road networks, and sanitation).
4. To examine the current situation in the sphere of educational and health services, focusing on efficiency and spatial distribution.
5. To analyse the environmental and social issues related to

urbanisation and their consequences to the life quality.

6. To develop planning interventions and recommendations that can enhance quality life and attain sustainable urban development.

Research Hypothesis

The unregulated and rapid urbanisation in Najaf has created spatial imbalances in the distribution of services as well as the rise of urban life quality that lacks quality due to a lack of infrastructure, increased population density, and the rise of informal settlements.

Research Methodology

The study is descriptive-analytical, based on the quantitative methods, including:

This study will involve census extraction and analysis of census data that happened in the years 1977, 1987, 1997, 2009 and 2024.

- Installation of open source Geographic Information Systems (GIS) to map growth trend of cities.
- Adding service measures of municipal, water, electricity, and urban planning organisations.
- The use of the Iraqi planning efficiency standards to determine the performance of educational and health services.
- Field interviews and observation studies to track the effects of urbanisation on quotidian experience of the residents.

Research Hypothesis

"Uncontrolled and fast urbanization in Najaf has created sharp spatial inequalities in public services provision and a significant decline in the quality of life in the whole city. This trend is attributed to the rampant lack of infrastructure, increase in population density and the unmonitored growth of informal settlements.

Research Methodology

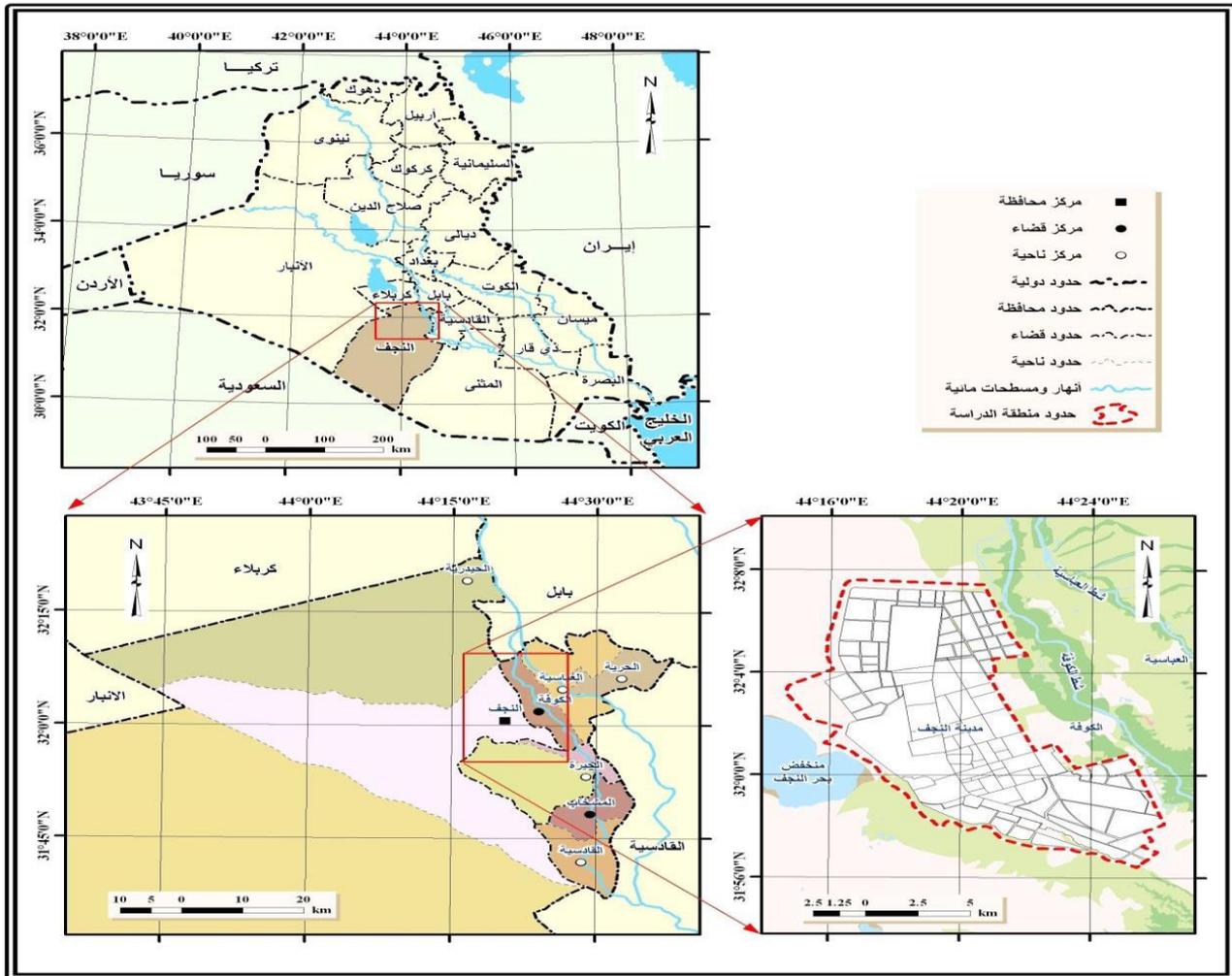
The method used in the study is descriptive-analytical with a quantitative reinforcement, namely:

1. Data analysis based on the national population census of the year 1977, 1987, 1997, 2009, and 2024.
2. Use of open source Geographic Information Systems (GIS) to examine patterns of urban growth.
3. Gathering of service-delivery data of the municipal, water,

electricity, and urban planning departments.

4. Use of Iraqi standards of planning and efficiency to determine the quality of educational and health services.

5. Field interviews and observations to be reviewed to track the effects of urbanization on the daily life of residents.



Sources compiled by the researcher based on: 1- The Survey and Geological Survey Authority 2- Najaf Municipality Directorate 3- Satellite imagery from 2023 4- Geographic Information Systems (GIS)

Part one: Urbanization Concept and Quality of Life.

I: Urbanization and its Idea.

Urbanization is the gradual change of a society that mostly engages in rural to a well founded urban focus. It is also generally considered to be one of the most relevant geographical and social phenomena that sums up the overall course of human evolution. The United Nations Human Settlement Programme (UN-Habitat, 2020) describes urbanization as the percentage of urban population in relation to the total population in a country, which is accompanied by the expansion of urban space and the transfer of economic and social processes to an urban system.

Urbanization, in the scenario of developing urban centers and specifically in Iraq, takes the form of a quick imbalanced process. It often puts a significant strain on the municipal services and infrastructure systems, which is a by-product of natural demographic increase, reinforced by the rural-to-urban migration trends (Al-Husaini, 2019). As King (2021) points out, the issue of urbanization cannot be condensed to the point of higher numbers of people living in cities; instead, it entails a major change in the way people live, social interactions, residential patterns, infrastructure and the way people receive services.

Secondly: The Process of Urbanization of Iraqi Cities.

This is because the urbanisation process of Iraqi cities can be divided into various phases. The first development wave started in 1950s and was characterized by growth in administrative, religious and business aspects. Another step in the 1970s and 1980s that was enabled by the oil boom spurred the urban and service growth even more. The third and latest phase, which can be observed after 2003, particularly in the city of Najaf is one that is characterized by an intensive horizontal expansion which is a result of urban population growth, internal migration, and mostly unplanned urban development (Mahdi, 2022). The urban matrix of Najaf has extended since the historic precinct that is located around the Imam Ali Shrine to northern and eastern suburbs, creating new neighbourhoods including Al -Hawli, Al -Shurta and Al -Adnani, thus changing the social and spatial structure of the city.

Third: The Concept of the Quality of Life.

In modern context, quality of life refers to the level of social, economic, psychological wellbeing of the people, in their urban environment. World Health Organization (WHO, 2019) describes it as: the feeling of belonging to the life within the context of culture and values one lives and the degree to which it applies to his or her goals, expectations, and standards. This construct is both material determinants which include housing, income and public services and non-material determinants such as a feeling of security, belonging, clean environment as well as fair access to services (Pacione, 2003). This indicator is often operationalised in the Iraqi urban setting by measuring the sufficiency and quality of municipal infrastructure like water supply, electricity, sanitation, education, healthcare, and road infrastructure.

Fourth: The Relationship Between Urbanization and Quality of Life

The correlation between urbanization and the quality of life is two-sided and multifaceted; on the one hand, with the high level of the organized urbanization, the possibilities of raising the standard of living grow with widening the services, promoting the employment opportunities, as well as the improved infrastructure. On the other hand, unregulated urbanization may trigger a decrease in living standards, which may be contributed by the overload of resources, the reduction of services, and an increase in the level of pollution and overcrowding (Galea et al., 2018). The empirical data of the Iraqi cities, such as Najaf, showed that the urban growth after 2003 did not correspond to the same infrastructure

development, resulting in the lack of quality-of-life indicators, including power outages, water supply, the development of informal settlements, and urban pollution (Al-Janabi, 2020).

Fifth: Quality of life in Cities Measures.

There exists a vast range of indicators to evaluate the quality of life in a city, however, the most relevant ones are listed by the OECD (2021) as follows:

- **Population Measurement**: Population growth, population density and population migration.
- **Service Indicator**: Water, electricity, sanitation, education, and health services.
- **Environmental Indicator**: Air Quality, cleanliness, waste management, and green spaces.
- **Economic Indicator**: Income, employment opportunities and cost of living.
- **Social Indicators**: Safety, civic engagement and equal distribution of services.

These pointers are fundamental to the understanding of the lived experience in Iraqi cities, especially when this is coupled with tendencies in urbanization and spatial growth, just as the case of Najaf.

Section Two: Population Growth and Demographic Analysis in Najaf (1977 -2024)

First: Population Growth and its General Trends.

The population of Najaf has been growing at a very high rate in the last 50 years, and the reasons behind this are:

- Natural growth caused by high birth rates.
- Migration within the rural areas and other neighbouring centres.
- Economic and religious changes that have placed Najaf as an important urban and spiritual centre. The growth of the population is one of the main forms of urbanization that lead to the spread and increased pressure on municipal services (UN-Habitat, 2020). The population of the city during the years 1977, 1987, 1997, 2009 and 2024 can be summed up as follows through the data on the population of the city as per the Iraqi Ministry of Planning and national census records: the 1977 population was 188, 509, which increased to 819, 566 in 2016. In 1977, the city, however, constituted 48.4 0 per cent. of the total population of the governorate (389,680)

and in 2024, it made 52.0 per cent. of the population of the Najaf governorate (1,576,089). The 2024 growth rate stood at 3.2%. It has a population of 12,810 hectares, a density of

residents of about 639.8 persons per hectare as indicated in Table (1).

Table (1) Population number, growth rate and percentage change of the population (1987 1997 2009 2024).

Area: Hectares	Percentage of the city's Population from the Governorate	Population Size of the Governorate	Annual Population Growth	Increase	Population Increase	Population Size	Year
900	48.4	389680	-	-	-	188509	1977
4100	52.4	590078	6.2	39	120501	309010	1987
6250	50.4	775042	2.6	20.8	81515	390525	1997
6720	78	1221228	4.7	39	250139	640664	2009
12810	52	1576089	3.2	21.8	178902	819566	2024

Source: Iraqi Central Statistical Organization, General Population Censuses (1977, 1987, 1997, 2009, 2024 Estimated).

The table shows that with a 47-year population growth, the population of Najaf has grown more than 6 times revealing rapid and imbalanced urban growth. This trend is explained by: (1) development of the city as a religious centre of the whole world (which attracts pilgrims and students both in Iraq and internationally), (2) the growth of commercial and service trade, and (3) a high natural growth.

Third: Spatial Distribution and Population Density.

Najaf is defined by the great density of population in the centre of the Imam Ali Shrine and slowly declines towards the suburbs. Al-Janabi (2021) reports that the central density is over 20,000 people per hectare, and the peripheral neighbourhoods have around 6,000 people per hectare. This high level of spatial heterogeneity puts a lot of pressure on central facilities and reveals the inadequacy of infrastructure in newer neighbourhoods. The growth has been driven towards the east and north along with limited land in the southwest where the religious activity and Wadi alSalam cemetery take up a considerable space.

Fourth: Population Growth by explaining it in terms of Urbanization.

The increase in population of Najaf is an automatic result of the urbanisation that has seen the city grow over the past few decades. Nevertheless, it has not kept pace with the adequate

development of what should be considered as infrastructures, which have led to the overstrain on water supply, lack of adequate electricity and sewage systems, unplanned horizontal growth, and shortage of learning and health facilities within some of the newer neighbourhoods. Such a state of affairs begs a key question regarding the ability of the city to support future growth without affecting the quality of life in the city (Al-Khafaji, 2023).

Fifth: Urban Growth Trends Spatial Analysis.

Najaf expansion phase (1977-1987) is the crucial stage in the context of the urban development process of the city. It is at this time that Najaf Governorate was established which made the city an administrative centre. As a result, the urban and cultural developments were carried out through NajafManadhira and NajafKufa axes. Economic changes that accompanied population growth in this period were economic growth in terms of per-capita income and growth in urban transportation system, financial mobilisation with the Real Estate Bank loan programmes. Its master plan (1973-1985) estimated the size of the city at 2,120 hectares. By 1987 the region had increased to 4,100 hectares which extended longitudinally on both sides of the NajafKarbala road after the southern land boundary was used up. This was contributed by population growth, internal migration to settle in residential areas and influx of displaced people who occupied the

demolished parts of the old city and were given compensatory plots. In 1987, this population was listed at 309 010 (Latif Al-Anbaki, 2016, p. 77).

The following phase (1987-2003) which was marked by sanctions imposed observed stagnant urban growth. Between 2003 and 2009 however, there was a post sanctions phase. It was in the year 2003 that the urban growth reached its peak because poor planning controls were ignored and informal settlements were allowed to expand, making it possible to transform vast agricultural lands and changing the land use that consequently affected the quality of the environment and

the welfare of the people (Mahdi, 2022). This period is one of the widest periods in the history of the city, which marks the climax of urbanization, growth, and building. The development of the contemporary urban utilisation was a propagation of public services, which were a considerable part of this period. The city was still growing northwards, especially since it had depleted current areas and consumed the remaining open areas. Its size at this stage amounted to around 6,720 hectares and in the second half of the phase (2009-2024) it had increased to 12,810 hectares (Latif Al-Anbaki, 2016, p. 77).

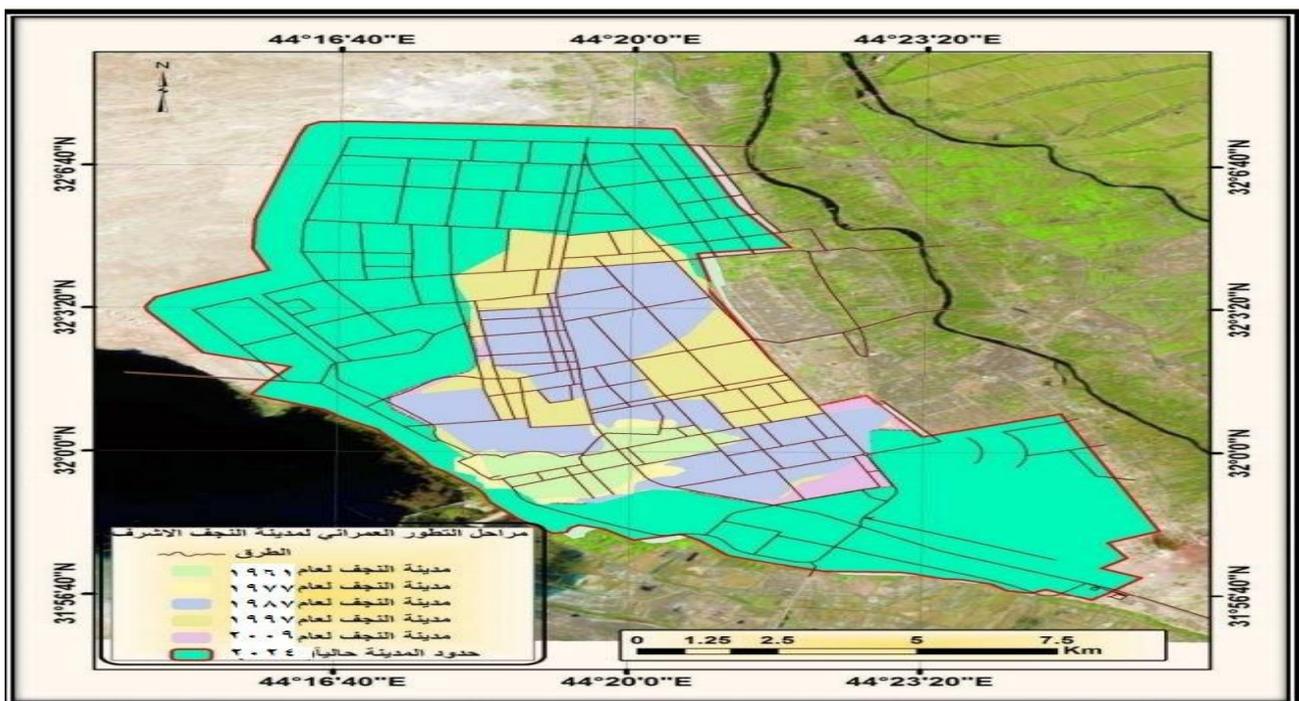
Table 2 presents the urban area change rate in 1977-1987, 1987-1997, 1997-2009, and 2009-2024.

Time period,	Urban area (km ²),	Percentage increase (%)
300.45%	→4100900	1977–1987
83.3	4100 → 6250	1987–1997
31.6	6250→ 6720	1997–2009
99.1	6720 → 12810	2009–2024

Najaf Municipality Directorate, Najaf Municipal Department, Urban Planning, Statistics, Planning and Follow-up Sections,

Urban Growth and Land Use Report in Najaf City, Data (G.M.) for the period 1961-2024(

Map (2): Stages of Urban Expansion in Najaf City



Source: Researcher's work based on the Najaf Municipality Directorate, Basic Design Division

Third Section: Development of Infrastructure in Najaf and its Effect to the Quality of life.

First: Infrastructure is the foundation of any sustainable urban development that represents the systems of physical facilities protecting stability and the welfare of the population, such as water, electricity, sanitation, and roads. As with most Iraqi cities, in the case of Najaf, urbanization is quick and population growth is high and puts a lot of pressure on this infrastructure that has not increased correspondingly with population growth (Al-Janabi, 2020).

Second: Water System in Najaf.

Sources of water and the everyday production.

Najaf relies on pump and desalination facilities which are located along the Euphrates River at the Kufa region, whereby the drinking water is channeled into the city using major pipelines. As of 2024, the average daily volume of drinkable water was about 360,000 cubic metres, as compared to the actual demand, estimated to exceed 450,000 cubic metres (Directorate of Water Najaf, 2024). This deficit of approximately 90,000 cubic metres/day causes episodic water shortages in the outer districts, and especially in the summer season.

Water Quality

Lab tests indicate that in some neighborhoods, the level of total dissolved solids (TDS) in the treated water is extremely high (more than 1,200mg/L), reducing the quality of potable water and its usage as a domestic item (WHO, 2022). Additionally, the haphazard growth of water network has spawned the emergence of variability in the pumping pressure and contamination threats to the earlier pipelines.

Effects of Water System on the Quality of Life.

Reducing the water shortages and stabilising the supply would decrease the dependency of the residents on water tankers, reducing the expenditures and decreasing the cases of intestinal diseases in poor and unofficial settlements, where the sanitary situation is already threatened.

Third: Electricity System.

Production and Supply

The mean daily electricity supply in Najaf was roughly 17 hours of supply, but during peak summer periods the supply had dropped down to seven hours of supply (Ministry of Electricity, 2024). The city is forecasted to have the need of

about 1,200 megawatts, whereas very little supply is above 850 megawatts.

Influence of the Power shortage.

This leads to a growth in the reliance of the residents on privately owned generators that not only pollute the atmosphere but also increase the cost of living. The constant disruption of power to educational, healthcare, and public service providers also disrupts the quality of life of the entire city, which leads to the erosion of the overall quality-of-life index in the city (Hassan, 2023).

Fourth: The Sewerage System

Current Networks and Issues.

The sewerage infrastructure in Najaf only covers approximately 68 percent of the urban population (Najaf Sewage Directorate, 2024) at the moment, with newer and informal neighbourhoods using cesspools. These systems are poor and often blocked with the age and the slim diameter of the pipes.

Environmental and Health Effect.

A sewage leakage on underground and surface areas has polluted the underground water, increased foul smells, and helped insects to multiply in overcrowded districts thus endangering the health of people and reducing the comfort of the environment to those living in such areas (UN-Habitat, 2021).

Fifth: Road and Transportation Network.

Network Development

The pavements of the roads in Najaf have increased to about 220 km in 2009 and to 370 km by 2024 (Directorate of Roads, 2024). However, approximately a quarter of these roads need to be rehabilitated by the deterioration and traffic.

Types of Roads

The network comprises:

Principal highways that connected Najaf with other governorates including the Karbala and NajafKufa roads.

Residential areas that have internal roads, some of which are still narrow or unpaved, especially in the eastern suburbs.

Urban Transportation Problems.

The city is characterized by extreme traffic congestion particularly in the historical centre which surrounds Imam Ali

Shrine which can be attributed to small streets, a large number of visitors and poor parking facilities. Poor connectivity of roads is also a problem in emerging neighbourhoods, further increasing the time spent on travelling to schools and healthcare institutions (Al-Kaabi, 2022).

Sixth: How to Study the Relationship between Infrastructure

and Quality of Life.

According to the above indicators, it can be noted that the supply of the basic services in Najaf has been lower in comparison to the rapid population growth. The correlation between the aspects of infrastructural elements and quality of living can therefore be summarised as follows:

Infrastructure Component	Current Service Level	Impact on Quality of Life
Water	Irregular supply and 20% deficit	reduced environmental and health well-being
Electricity	Daily outages of 7 hours	high costs and reduced living comfort
Sanitation	Only 68% coverage	environmental pollution and health problems
Roads and Transportation	Congestion and deterioration	difficulty of movement and increased travel time

It is found that, to enhance the quality of life in Najaf requires a comprehensive infrastructural plan, that must facture in the consideration of the growth in population, geographical distribution of the municipality services, and the renewal of outdated systems by means of sustainable investment models.

Section Four: Analysis of the Reality of Services and Infrastructure in the City of Najaf

4.1 Water Infrastructure

Water as one of the most basic determinants of the quality of life in the urban area is inseparably connected with social wellbeing and public health. The increased water demand in the city of Najaf is a steady trend that has been growing within the last 20 years due to the rise in population and a rapidly rising urbanization rate. Najaf Water directorate report revealed that municipal water production has increased to around 480 000 m³ day⁻¹ in 2024 (an increase of 50 000 000 m³ day⁻¹ over 15 years) whereas resident population has increased by over 70 000 000 in 2024 (an increase of over 70 000 000 in 15 years). This has resulted in the increase in water supply not keeping up with the growth in population, which has reduced the availability of water per capita and caused frequent shortages, especially in the northern and

eastern precincts (Najaf Water Directorate, 2024). Laboratory testing indicates the distributed water sometimes has a high turbidity and total dissolved solids (TDS), which limits domestic usage and daily quality of life of residents (Al-Fatlawi, 2021). In order to improve the water situation, the current paper supports the distribution network upgrading and loss reduction by systematic maintenance and incorporation of smart metering systems.

4.2 The Reality of Electricity

Electricity is one of the leading performance indicators of the livability in the city. This is despite the fact that the situation in recent years has seen some relative improvements in generation and distribution, yet Najaf is plagued by a lack of enough supply as compared to the real demand. In 2009, the average electricity supply was about 14 h/day, but in 2024, it slightly increased to 18 h/day, but shortages will still be there, especially in the summer season when the temperatures will be above 50 °C (Ministry of Electricity, 2024). This deficiency is explained by the weakness of transmission and distribution networks and unplanned urban sprawl that has increased the uncontrolled demand of energy. The few solar energy projects have partially reduced the pressure on the grids, but the use

of them is still limited even though the climatic conditions of Najaf are conducive to photovoltaic development (Hussein & Abbas, 2023).

4.3 Sewerage Network

Structural demerits plague the sewerage system in the city of Najaf due to old pipes, frequent blockages, and insufficiency of treatment plants. The current network currently serves approximately 68% of urban areas and this causes the newly developed and informal neighbourhoods to have to use cesspools thus polluting groundwater and producing fumes as well as environmental and health risks (Najaf Municipality, 2024). An example of statistical evidence is to prove that the exact number of auxiliary treatment plants should be installed to fill the current gap of scarcity and improve the remediation of the environment with a total capacity of 150 thousand m³ in a day (Al-Taie, 2022). Such impediments undermine the hygiene standards in the community and worsen the general standard of living, particularly in the congested districts.

4.4 Roads and Transportation Networks.

Najaf has managed to mature its road network in the past 20 years; the length of paved roads has grown by 720km to about 1150km by the year 2024 (Najaf Municipality Directorate, 2024). However, some of the internal roadways are either narrow or unpaved, especially those that were built after 2010. There is a high asymmetry in supply and demand in the transport system, and congestion is increasing in the old city centre and commercial areas. Such causes of such congestion can be termed as lack of proper traffic control, lack of adequate parking places, among others, as well as the closeness of markets to main thoroughfares (Al-Jubouri, 2020). In addition, the lack of modern transportation infrastructure, namely, electric buses or mass-transit lines, contributes to the prominence of private transportation, which contributes to an increase in pollution and is harmful to the wellbeing of residents.

4-5 Analysis of Relationship between Urbanization and Quality of Infrastructure.

The above discussions all lead to a point of showing how the high rate of urbanization experienced in Najaf has exceeded the ability of the infrastructure and services. Water, electricity, sewage and road systems have not been able to keep pace with the pressures created by the growth of population and space. This has shown that urbanization of Najaf has now become quantitative with no consideration of qualitative

growth at the cost of life quality and citizens happiness level (UN-Habitat, 2022). As a result, the improvement of the living standards in Najaf requires a complex approach to urban development that would focus on the creation of sustainable infrastructure, energy resources diversification, transportation systems, and critical gaps in the provision of the initial services.

Section Five: Housing and Environmental Problems Accompanying Urbanization in Najaf

5-1 Over the past few decades, Najaf has witnessed rapid waves of urbanization, characterized by unprecedented spatial expansion and population growth. However, this urbanization was not always organized or supported by effective urban planning, leading to the emergence of numerous housing and environmental problems that affected the quality of urban life and the social well-being of the population. These problems ranged from haphazard housing growth and high land prices to poor housing and services, widespread pollution, and weak infrastructure in modern neighborhoods (Al-Mayah, 2021).

5-2 Informal Settlements:

Informal settlements are among the most prominent consequences of unregulated urbanization in Najaf. Numerous informal neighborhoods have sprung up on the city's outskirts as a result of internal migration from neighboring districts and sub-districts, in addition to the limited supply of official housing units. Data from the Najaf Municipality (2024) indicates the existence of more than 14,000 informal housing units distributed across areas in the north and east of the city, such as Al-Salam and Al-Ghadir neighborhoods, representing approximately 12% of the total housing stock. These neighborhoods are characterized by a lack of basic services such as sanitation and potable water, poor quality building materials, and high population density within each unit (Ministry of Planning, 2023). This phenomenon negatively impacts the urban environment and creates pockets of poverty, pollution, and a decline in the quality of education and public health.

5.3 Deteriorated quality of housing and the high price of land.

Najaf city is faced with severe challenges in its formal housing sector. The value of land in the central districts of the city has risen more than 300 per cent in the past two decades forcing many households to live in the outskirts of the city in undeveloped areas or to build small and informal homes without authorization (Al-Khafaji, 2022). Besides, the old

buildings still found in the historic quarters are still victims of urban and structural decay due to poor maintenance, population density, and narrowness of the medieval alleyways, thus rendering such places unfavorable to healthy living. According to the empirical fieldwork, about 28% of the residents of Najaf live in the area less than 100 m² -units- an indicator of low housing quality, which has been caused by the unplanned and rapid urban growth (UN-Habitat, 2022).

5.4 Environmental issues in the City.

A. The air quality indicators have exacerbated in Najaf due to increased vehicle traffic as well as prolific use of individual generators and burning of municipal refuse, particularly in informal settlements, industrial estates, and Abu Talib, Al-Milad, and Al-Nida neighborhoods. CO₂ and PM₁₀ concentration in the monitors has reached 40 percent or higher on selected days compared to international limits (Al-Saidi, 2023).

B. Waste incineration: The informal sectors do not have a formal waste collection system and thus the residents have to burn waste in the open air. The practice emits toxic gases that affect the wellbeing of the population and increase the rate of respiratory diseases (Najaf Environment Department, 2024).

C. Impact of depleting green space: The proportion of green space per capita has reduced to less than 1.5m² compared to the international standard of 9m²/capita. This has resulted in increased intra-city temperatures and poor air quality of the ambient air.

5.5. Weak infrastructures in newly developed neighbourhoods.

Najaf and Al-Malad Residential developments that have developed after 2010 are plagued by conspicuous infrastructural shortages. Many of the neighborhoods do not have modern sewage systems, drinking water connections, and roads that are paved. Social amenities such as schools and health centres are not only inadequately located in number but also geographically isolated to the resident population to further add to daily crises and quality-of-life indicators (Al-Taie, 2022). This lack of coherence between planning authorities and municipal bodies in the process of this expansion has also served to support the development of the so-called underserved districts as yet another symptom of unsustainable urbanization.

5.6 Housing and Environmental Problems and their Effect on Quality of Life.

The nexus of inappropriate housing and environmental degradation in Najaf has led to a fall in the life satisfaction of residents and a decrease in the urban quality-of-life indicators in the health, environment and service dimensions. Poor housing, pollution and low infrastructure all contribute to increase the level of socio economic inequality and also introduces dangerous living conditions that are susceptible to environmental hazards. About 42 per cent of the city residents are unhappy with the local service delivery, whereas 36 per cent have frequent environmental or health conditions (Dawood & Jassim, 2024). Therefore, to improve living standards in Najaf requires a comprehensive planning model that will combine urbanization, modernization of infrastructure and the restoration of spatial service inequalities.

Section Six: Najaf Educational and Health Services and Quality of Life.

6.1 Educational and health services are a key pillar in the quality of life quantification of urban areas, as not only the foundation of human development, but also the indicator of the effectiveness of city planning. Najaf has experienced significant growth in these areas over the last two decades; however, this growth was not evenly spread across space so that the urban center and the outskirts have developed access imbalances (Al-Husseini, 2023).

6.2 Education Services in Najaf.

A. Quantitative institutional profile: According to the data provided by the Najaf Education Directorate, the number of educational institutions has grown between 265 in 2009 and 418 in 2024, including kindergartens, primary, intermediate and secondary educational institutions (Najaf Education Directorate, 2024). Nevertheless, the rate of a 57 percent rise in the number of institutions is surpassed by an equivalent 70 percent rise in population of the same time leading to an average of more than 42 pupils per classroom in some state schools.

B. Teaching staff and infrastructure: The number of teachers has been increasing at a modest rate with a teacher to student ratio of about 6.5 in 2024 as compared with 5.7 in 2009. However, there are still intense differences between districts; new neighbourhoods, including Al-Salam, Al-Mukarramah, Al-Askari, and Al-Nida, lack qualified teachers and school infrastructure (Al-Moussawi, 2022).

C. Spatial efficiency and distribution: On spatial analysis, it is certain that educational institutions are concentrated in the centre of the city and its neighbourhood areas that become less dense towards the peripheral areas. Some of the outlying districts have a mean distance of over 1.5km to the closest school, which is higher than the national planning standards (Ministry of Planning, 2022). Such spatial inequity is the obstacle to the provision of equal educational opportunities and is a crux of the quality-of-life enhancement issue.

6.3 Health Services at the city of Najaf.

A. Existing healthcare delivery: There are 17 state and non-state hospitals and more than 65 health centres in Najaf City (Najaf Health Directorate, 2024). Al-Sadr Teaching Hospital and Al-Hakim Hospital are leading a hospital that serves a wide range of people. However, according to the capacity indicators, there is a deficiency since there is only 1.1 beds per 1,000 people, which is significantly lower than the global average of 3 beds per 1,000 people (World Health Organization, 2023).

B. Healthcare staff: In 2024, the number of physicians had increased to about 1,850, which is a 25 per cent higher than in 2009. The majority of practitioners are however concentrated in central city hospitals which generates an imbalance in terms of a spatial distribution of services.

C. Spatial access: Geographical calculations have shown that

the mean travel time to closest health centre is between 10 and 20 minutes in the outlying districts, but not higher than 5 minutes in the city centre. This inequality prevents access to emergency services in a timely manner among peripheral residents, which has a negative impact on the quality-of-life indicators (Al-Tamimi, 2022).

6.4 Educational and Health Services and Quality of Life Relationship.

Analytical evidence proves that quality improvements in educational and health services are a direct panacea of quality-of-life indicators because these areas are at the core of sustainable human development. The field surveys reveal that families living in the vicinity of educational and health facilities are more satisfiable and cohesive. On the other hand, unintentional urbanization brings together such services to form sharp spatial differences in the quality of living (UNHabitat, 2022). Spatial equity in the distribution of services is thus necessary in the achievement of the overall well-being of the people of Najaf.

6.5 Analysis of Development Gaps

Table 3 represents the comparative study of education and health indicators in the Najaf province, displaying the most relevant development gap, and it can be summed up as follows:

Table 3: Education and Health Indicators--Current Position versus Iraqi position and the difference between Them.

The indicator:	National/global standard	Current situation in Najaf 2024	Relative gap
+40%	30 student	42 student	Number of students per class
-63%	3.0	1.1	Number of hospital beds per 1000 people
-18%	8.0	6.5	Number of teachers per 100 students
+50%	1 km	1.5 km	Distance to school
+30–100%	≤10 m	10–20 m	Distance to health center

These statistics vividly depict a spatial injustice in the dispersion of the services causing a hindrance of the spatial justice and quelling development prospects of the people living in the city.

6.6 Future Projections of Developing Education and Health in Najaf.

- Increase educational services to the peripheral neighbourhoods, considering anticipated population densities.
- Develop new expert hospitals, within the growth areas, to reduce congestion in the city center.
- Improve the effectiveness of educational and health staff in terms of long-term professional development courses and knowledge sharing programs.
- Integrate Geographic Information Systems (GIS) in planning and service distribution to achieve spatial equity.
- Strengthen the presence of partnerships between the public and the private in developing education and health infrastructure.

Section Seven: Problems and Setbacks to Quality of Life in Najaf.

7-1 Urban quality of life indicates the aggregate stage of social, financial as well as environmental wellbeing of the population. It is a direct product of the interplay of set of inter-related factors, including infrastructure, public services, urban environment, economy, as well as spatial planning. Although the urban growth and service delivery experienced in Najaf have occurred in the last 20 years, a lot of challenges and barriers exist, and this is why urban development is not balanced and sustainable (Al-Hameed, 2023).

7.2 Population problems and fast urbanisation.

High rate of population growth forms one of the major threats facing the city. This is a 300 percent increase in the population of Najaf, which was about 390,000 to over 1.6 million in 1977 and 2024 respectively (Ministry of Planning, 2024). This fast growth triggered uncontrolled horizontal development, the development of new spaces that did not receive full services and increased the pressure on the infrastructure, water, electricity, and sanitation. The fact that the population growth did not correspond to the urban planning created a skewed city form where economic activities and jobs were concentrated in the old centre and the outer layers were predominantly residential (UN-Habitat, 2022).

7.3 Economic and Social dilemmas.

Najaf has been facing economic barriers such as lack of diversification in productive endeavors, overdependence on religious tourism, and this has exposed the city to seasonal changes. The low chances of youth getting jobs have led to high underemployment and particularly when it comes to university graduates and the unemployment rate in the city is nearly 15 per cent in 2024 (State Statistics Office, 2024). The social differences in the income of the central and peripheral neighbourhoods have contributed to the apparent social divide, which is realised in differences in service quality and opportunities in education and health (Al-Fatlawi, 2022).

7.4 Environmental Challenges

The urban surrounding in Najaf is one of the areas, which have been impacted the most in the rapid urbanization process, giving it rise to various negative phenomena, the most notable ones being:

- Air pollution through vehicle emissions, domestic generators and garbage burning.
- Deterioration of the quality of groundwater in the form of overexploitation of absorption pits in underserved regions.
- Lack of green cover, and hence, the development of urban heat islands and increasing temperatures on neighbourhoods.
- Aesthetic and visual pollution caused by the unplanned growth and chaotic building without compliance with planning standards (Al-Saidi, 2023).

Besides, the lack of an integrated solid waste management system has led to the piling up in the periphery and informal settlements, which are threatening the well-being and social life of people.

7.5 Planning and Administrative Issues.

Although the plans of the city of Najaf have been developed, their real projects are hindered by a number of challenges including:

- The number of entities that manage urban projects, which results in overlapping jurisdiction.
- There is poor coordination between municipal and planning agencies, which has led to the fact that there has been a lack of a coherent vision of how the city should grow.
- There is no contemporary spatial database to aid in evidence-based decision making.

- Insufficient technical competency in some service departments, which prevents them from putting in place sustainable development plans (Al-Taie, 2021).

Moreover, the inadequate participation of local communities in decision making on the planning aspect usually leads to top-down planning that does not take the real needs of the population.

7.6 Problems of infrastructure and services.

The city is plagued by deficit in infrastructure occasioned by high horizontal growth. The systems of water, electricity, sewage, and road network have failed to match urbanization. The spatial inequity has been fuelled by the difference in service levels between central and peripheral neighbourhoods where there are high service coverage in some areas and lack of basic amenities in others (Hussein & Abbas, 2023).

7.7 Cultural Clashes and Social Value changes.

Due to the rapid urbanisation, lifestyles and social behaviour have changed in Najaf where some of the traditional values of social solidarity and community cooperation have disappeared with the advent of individualism and consumerism. The development of urban areas has also broken some of the social structure that existed in the past, creating an age divide in values and practices, which is expressed in the urban and cultural identity of the city (Al-Janabi, 2022).

7.8 Conclusion of Challenges and Obstacles.

The most notable issues that face quality of life at Najaf can be summarised as follows:

- Uncontrollable and fast urbanisation exceeding the ability of services to serve its demand.
- Infrastructure shortage in terms of water, electricity and sanitation.
- Rapid population increase and rising domestic migration.
- Disproportionate distribution of educational, health and social services.
- Environmental pollution and bad management of natural resources.
- Institutional inefficiency and poor systems of urban planning.
- Weakness of social values and loss of urban identity.

All these impediments point to the fact that the quality of life improvement in Najaf requires a long-term strategic plan

based on sustainable development guidelines and the combination of spatial, social, economic, and environmental aspects.

RESULTS

Through a study of the truth of Najaf and keeping track of its demographic, urban, service- as well as environmental dynamics, a number of important conclusions can be drawn shedding light upon the nature of urbanisation and the changing standards of life:

- Urbanisation has been mainly caused by the rapid population growth which rose to more than 1.6-million in 2024 having previously been less than 400000 in 1970s thus putting enormous pressure on the resources and services.
- There has been horizontal expansion that has encroached the agricultural land but it has not been planned out so as to contain the sprawl. Informal settlements thus have been initiated, which lack access to basic infrastructure and services.
- There is a decline in the standard of the public services (electricity, water, sanitation, roads) due to the old systems and lack of development to meet the increase in demography.
- Lack of even access to services in both central and peripheral neighbourhoods has led to a distinct imbalance in the provision of spatial services at the cost of quality of life in certain neighbourhoods.
- Weak urban environmental governance leads to alarming environmental phenomena, i.e. air and water pollution and solid wastes and lack of green spaces.
- There is poor institutional coordination and disjointed planning between the municipal, housing, and planning development decisions have produced partial and fragmented development choices.
- The urbanisation process has changed the socio-cultural structure of the city; the archaic values have lost their significance, and the new behavioural patterns that support individualism and consumerism have been born.
- There is inadequate educational and health facilities to cater to the demand, particularly in the outer places hence low levels of satisfaction and general living standards. These findings are consistent with the findings of Al-Hameed (2023) and UN-Habitat (2022) who argue that urbanisation in Iraqi cities is going at a higher rate than the current planning and

administration can handle.

8.2 Recommendations

Based on the findings mentioned above, the following proposals are suggested to improve quality of life and create sustainable urban development in Najaf:

1. prepare a revised city master plan which will take into consideration the expected population increase and urban trend till 2040.
2. Enhance the institutional alignment of municipal, planning, environmental and service powers within one administrative body.
3. Adopt Geographic Information Systems (GIS) and open data platforms to guide the service delivery and infrastructure management.
4. Water, electricity, sewage extensions to new neighbourhoods as well as increasing operational and maintenance efficiency.
5. Control horizontal growth and encourage vertical growth of residential structures in order to save farmland.
6. Improve the city access road system, increase city access points, and expand major streets to prevent traffic jams and enhancing the traffic flow.
7. Improve environmental control through strict measures to limit burning of waste, creation of green belts and introduction of awareness programs to the people.
8. Enhance the spread of geography, workforce and supply of new equipments and technologies in education and health services.
9. Engage communities in urban planning to make sure that the plans are based on local needs and social justice.
10. Realise smart and sustainable urban principles in resource, energy and transport management to make urban efficiency a notch higher.
11. These suggestions are in line with the United Nations Sustainable Development Goals 2030 (UN-Habitat, 2020) that focus on creating a more sustainable, equal, and resilient city.

CONCLUSION

The empirical facts witnessed in Najaf depict that unregulated and swift urbanization has resulted in significant changes in the spatial dimension, social dimension as well as

environmental dimension, consequently having a direct effect on the quality of life enjoyed by its residents.

Despite the efforts of the government to promote certain areas, deep-rooted issues relating to infrastructure, unfair delivery of services, as well as environmental sabotage, remain to be major frustrates to achieving sustainable development.

The development of the quality of life in Najaf requires the comprehensive strategic vision, which would be based on the synthesis of the planning, administrative, economic, and environmental factors.

This vision should be supported with modern urban data and actively involve the community, thus making sure that the urbanization process will not be based on the pressure, but will be a driver of sustainable development that will be able to support the city identity and the future urban path.

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